SEQUENCE LISTING

<110> USUDA, YOSHIHIRO KURAHASHI, OSAMU

<120> METHOD FOR PRODUCING L-METHIONINE BY FERMENTATION

<130> 0010-1057-0

<140> 09/441,055

<141> 1999-11-16

<150> JP 10-326717

<151> 1998-11-17

<160> 29

<170> PatentIn version 3.1

<210> 1

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 1

gggaattotg gcaggaggaa ctggcgca

28

<210> 2

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 2

gggtcgacgc tcatattggc actggaag

28

<210> 3

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 3

gggtcgacat cagtaaaatc tattcatt

28

<210> 4

- <211> 28
- <212> DNA
- <213> Artificial Sequence
- <220>
- <223> Synthetic DNA
- <400> 4

ggaagcttgc ccgagggaaa gatctgta

28

- <210> 5
- <211> 28
- <212> DNA
- <213> Artificial Sequence
- <220>
- <223> Synthetic DNA
- <400> 5

gggcatgccc agggaacttc atcacatg

28

- <210> 6
- <211> 28
- <212> DNA
- <213> Artificial Sequence
- <220>

28

28

<223>	Synthetic DNA
<400> gggaat	6 toto atggttgogg ogtgagag
<210>	7
<211>	28
<212>	DNA
<213>	Artificial Sequence

<220>

<223> Synthetic DNA <400> 7

ggaagcttgc gtgagatggg gattaacc

<210> 8

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 8

gggaatteta etgetagetg etettgeg

<210> 9

<211> 75

-4-

<212:	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic DNA	
<400>	9	
ggaag	cttaa aattttattg acttaggtca ctaaatactt taaccaatat aggcatagcg	60
cacag	acgca tgccc	75
<210>	10	
<211>	75	
<212>	DNA	
<213>	Artificial Sequence	
<220>		
<223>	Synthetic DNA	
<400>	10	
gggcat	gogt etgigogeta igectatati ggitaaagia titagigace taagicaata	60
	taag cttcc	75
<210>	11	
<211>	18	
<212>	DNA	
<213>	Artificial Sequence	

<220>

<223> Synthetic DNA

<400> 11

caacagtttg agctaacc

18

<210> 12

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 12

gcggtttttt tgccggatgc

20

<210> 13

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 13

toggotacgo aactaatg

18

<210> 14

- <211> 18
- <212> DNA
- <213> Artificial Sequence
- <220>
- <223> Synthetic DNA
- <400> 14

gagaatgcac cgccaccg

18

- <210> 15
- <211> 18
- <212> DNA
- <213> Artificial Sequence
- <220>
- <223> Synthetic DNA
- <400> 15

tggcgcgtca cggtggcg

18

- <210> 16
- <211> 18
- <212> DNA
- <213> Artificial Sequence
- <220>

MAY.23.2002 2:23PM OBLON, S

<223> Synthetic DNA

<400> 16 gcacgtcggt ttcattag

18

<210> 17

<211> 1155

<212> DNA

<213> Escherichia coli

20

<220>

<221> CDS

<222> (1)..(1152)

<223>

<400> 17

atg Met 1	gca Ala	aaa Lys	cac His	ctt Leu 5	ttt Phe	acg Thr	tcc Ser	gag Glu	tcc Ser 10	gtc Val	tct Ser	gaa Glu	G1Y 3 33	cat His 15	cct Pro	48
gac	aaa	att	gct	gac	caa	att	tct	gat	gcc	gtt	tta	gac	gcg	atc	ctc	96
Asp	Lys	Ile	Ala	Asp	Gln	Ile	Ser	Asp	Ala	Val	Leu	Asp	Ala	Ile	Leu	

gaa cag gat ccg aaa gca cgc gtt gct tgc gaa acc tac gta aaa acc Glu Gln Asp Pro Lys Ala Arg Val Ala Cys Glu Thr Tyr Val Lys Thr

144

35

192

gge atg gtt tta gtt gge gge gaa ate ace ace age gee tgg gta gae Gly Met Val Leu Val Gly Gly Glu Ile Thr Thr Ser Ala Trp Val Asp 50

atc gaa gag atc acc cgt aac acc gtt cgc gaa att ggc tat gtg cat Ile Glu Glu Ile Thr Arg Asn Thr Val Arg Glu Ile Gly Tyr Val His 65 70 75 80

240

-8-

tco Sei	c ga r Asj	c at p Me	t Gl	c tto y Pho 85	t gad e Asp	c gci p Ala	t aad a As n	tco Sei	tgt Cys 90	gcg Ala	g gti a Val	t ctg l Leu	g ago	gc r Al	t atc a Ile	288
Gl ^y	aaa Ly	a cag g Gli	g to n Se: 10:	r Pro	gad Asy	e ato	c aac e Asr	caç n Glr 105	ı Gly	gtt Val	gad . Asp	c cgt	geo Ala 110	a Asj	t ccg p Pro	336
ctg Leu	gaa Glu	a cag a Gli 115	1 GT2	c gcg / Ala	ggt Gly	: gac / Asp	cag Glr 120	ı Gly	ctg Leu	atg Met	ttt Phe	ggc Gly 125	Туг	gca Ala	a act Thr	384
aat Asn	gaa Glu 130	r TIII	gao Asp	gtg Val	ctg Leu	atg Met 135	Pro	gca Ala	ect Pro	atc Ile	acc Thr 140	Tyr	gca Ala	cac His	cgt Arg	432
ctg Leu 145	A CT T	caç Glr	cgt Arg	cag Gln	gct Ala 150	Glu	gtg Val	cgt Arg	aaa Lys	aac Asn 155	ggc	act Thr	ctg Leu	cag Pro	tgg Trp 160	480
ctg Leu	cgc Arg	ccg Pro	gac Asp	gcg Ala 165	гЛа	agc Ser	cag Gln	gtg Val	act Thr 170	ttt Phe	cag Gln	tat Tyr	gac Asp	gac Asp 175	ggc Gly	528
aaa Lys	atc Ile	gtt Val	ggt Gly 180	тте	gat Asp	gct Ala	gtc Val	gtg Val 185	ctt Leu	tcc Ser	act Thr	cag Gln	cac His 190	tct Ser	gaa Glu	576
gag Glu	atc Ile	gac Asp 195	Gln	aaa Lys	tcg Ser	ctg Leu	caa Gln 200	gaa Glu	gcg Ala	gta Val	atg Met	gaa Glu 205	gag Glu	atc Ile	atc Ile	624
aag Lys	cca Pro 210	att Ile	ctg Leu	ccc Pro	gct Ala	gaa Glu 215	tgg Trp	ctg Leu	act Thr	tct Ser	gcc Ala 220	acc Thr	aaa Lys	ttc Phe	ttc Phe	672
atc Ile 225	aac Asn	ccg Pro	acc Thr	ggt Gly	egt Arg 230	ttc Phe	gtt Val	atc Ile	Gly	ggc Gly 235	cca Pro	atg Met	ggt Gly	gac Asp	tgc Cys 240	720
ggt Gly	ctg Leu	act Thr	ggt Gly	cgt Arg 245	aaa Lys	att Ile	atc Ile	Val	gat Asp 250	ącc Thr	tac Tyr	gly gg¢	Gly	atg Met 255	gcg Ala	768
cgt Arg	Cac His	ggt Gly	Gly	ggt Gly	gca Ala	ttc Phe	tct Ser	ggt Gly :	aaa Lys .	gat Asp	cca Pro	tca Ser :	aaa Lys	gtg Val	gac Asp	816

			260					265					270			
cgt Arg	tcc Ser	gca Ala 275	wrd	tac Tyr	gca Ala	gca Ala	cgt Arg 280	Tyr	gtc Val	gcg Ala	aaa Lys	aac Asn 285	atc Ile	gtt Val	gct Ala	864
gct Ala	ggc Gly 290	ctg Leu	gcc Ala	gat Asp	cgt Arg	tgt Cys 295	gaa Glu	att Ile	cag Gln	gtt Val	tcc Ser 300	tac Tyr	gca Ala	atc Ile	ggc ggc	912
gtg Val 305	gct Ala	gaa Glu	ccg Pro	acc Thr	tcc Ser 310	atc Ile	atg Met	gta Val	gaa Glu	act Thr 315	ttc Phe	ggt Gly	act Thr	gag Glu	aaa Lys 320	960
gtg Val	cct Pro	tct Ser	gaa Glu	caa Gln 325	ctg Leu	acc Thr	ctg Leu	ctg Leu	gta Val 330	cgt Arg	gag Glu	ttc Phe	ttc Phe	gac As p 335	ctg Leu	1008
cgc Arg	cca Pro	tac Tyr	ggt Gly 340	ctg Leu	att Ile	cag Gln	atg Met	ctg Leu 345	gat Asp	ctg Leu	ctg Leu	cac His	cag Pro 350	atc Ile	tac Tyr	1056
aaa Lys	gaa Glu	acc Thr 355	gca Ala	gca Ala	tac Tyr	ggt Gly	cac His 360	ttt Phe	ggt Gly	cgt Arg	gaa Glu	cat His 365	ttc Phe	ccg Pro	tgg Trp	1104
gaa Glu	ааа Lys 370	acc Thr	gao Asp	aaa Lys	Ala	cag Gln 375	ctg Leu	ctg Leu	cgc Arg	gat Asp	gct Ala 380	gcc Ala	ggt Gly	ctg Leu	aag Lys	1152
taa																1155

<210> 18

<211> 384

<212> PRT

<213> Escherichia coli

<400> 18

Met Ala Lys His Leu Phe Thr Ser Glu Ser Val Ser Glu Gly His Pro

5

10

15

Asp Lys Ile Ala Asp Gln Ile Ser Asp Ala Val Leu Asp Ala Ile Leu 20 25 30

Glu Gln Asp Pro Lys Ala Arg Val Ala Cys Glu Thr Tyr Val Lys Thr 35 40 45

Gly Met Val Leu Val Gly Gly Glu Ile Thr Thr Ser Ala Trp Val Asp 50 55 60

Ile Glu Glu Ile Thr Arg Asn Thr Val Arg Glu Ile Gly Tyr Val His 65 70 75 80

Ser Asp Met Gly Phe Asp Ala Asn Ser Cys Ala Val Leu Ser Ala Ile 85 90 95

Gly Lys Gln Ser Pro Asp Ile Asn Gln Gly Val Asp Arg Ala Asp Pro 100 105 110

Leu Glu Gln Gly Ala Gly Asp Gln Gly Leu Met Phe Gly Tyr Ala Thr

Asn Glu Thr Asp Val Leu Met Pro Ala Pro Ile Thr Tyr Ala His Arg

Leu Val Gln Arg Gln Ala Glu Val Arg Lys Asn Gly Thr Leu Pro Trp 145 150 155 160

Leu Arg Pro Asp Ala Lys Ser Gln Val Thr Phe Gln Tyr Asp Asp Gly
165 170 175

Lys Ile Val Gly Ilé Asp Ala Val Val Leu Ser Thr Gln His Ser Glu 180 185 190

- Glu Ile Asp Gln Lys Ser Leu Gln Glu Ala Val Met Glu Glu Ile Ile 195 200 205
- Lys Pro Ile Leu Pro Ala Glu Trp Leu Thr Ser Ala Thr Lys Phe Phe 210 215 220
- Ile Asn Pro Thr Gly Arg Phe Val Ile Gly Gly Pro Met Gly Asp Cys 225 230 235 240
- Gly Leu Thr Gly Arg Lys Ile Ile Val Asp Thr Tyr Gly Gly Met Ala 245 250 255
- Arg His Gly Gly Gly Ala Phe Ser Gly Lys Asp Pro Ser Lys Val Asp 260 265 270
- Arg Ser Ala Ala Tyr Ala Ala Arg Tyr Val Ala Lys Asn Ile Val Ala 275 280 285
- Ala Gly Leu Ala Asp Arg Cys Glu Ile Gln Val Ser Tyr Ala Ile Gly
 290 295 300
- Val Ala Glu Pro Thr Ser Ile Met Val Glu Thr Phe Gly Thr Glu Lys
 305 310 315 320
- Val Pro Ser Glu Gln Leu Thr Leu Leu Val Arg Glu Phe Phe Asp Leu 325 330 335
- Arg Pro Tyr Gly Leu Ile Gln Met Leu Asp Leu Leu His Pro Ile Tyr 340 345 350
- Lys. Glu Thr Ala Ala Tyr Gly His Phe Gly Arg Glu His Phe Pro Trp 355 360 365
- Glu'Lys Thr Asp Lys Ala Gln Leu Leu Arg Asp Ala Ala Gly Leu Lys 370 375 380

<210> 19

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 19

ggaagettaa geagagatge agagtgeg

28

<210> 20

<21:1> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 20

ggaagettgg tgcggtataa gaggeeae

28

<210> 21

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 21

gggcatgctg tagtgaggta atcaggtt

28

<210> 22

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 22

gggtcgactt aatccagcgt tggattca

28

<210> 23

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 23

tgtctgctgg gcggtaca

18

<210> 24

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 24

agagagtttt tcggtgcg

18

<210> 25

<211> 930

<212> DNA

<213> Escherichia coli

<220>

<221> CDS

<222> (1)..(927)

<223>

<400> 25

atg cog att cgt gtg ccg gac gag cta ccc gcc gtc aat ttc ttg cgt 48 Met Pro Ile Arg Val Pro Asp Glu Leu Pro Ala Val Asn Phe Leu Arg 1

gaa gaa aac gtc ttt gtg atg aca act tct cgt gcg tct ggt cag gaa 96 Glu Glu Asn Val Phe Val Met Thr Thr Ser Arg Ala Ser Gly Gln Glu 20 25 30

att ogt coa ctt aag gtt ctg atc ctt aac ctg atg ccg aag aag att 144

Ile	e Arg	g Pro	Let	1 Гуя	s Val	l Lev	1 Il∈ 40	e Leu	ı Asr	ı Lei	ı Met	t Pro	Lys	s Lys	: Ile	
gaa Glu	act Thr 50	gaa Glu	aat Asn	dag Gln	ttt Phe	ctg Leu 55	Arg	cto Leu	ctt Leu	tca Ser	a aad Asi 60	tca 1 Ser	cet Pro	tte Lev	g cag Gln	192
gto Val 65	gat Asp	att Ile	cag Gln	ctg Leu	ttg Leu 70	r Arg	atc	gat Asp	toc Ser	cgt Arg 75	gaa Glu	tcg Ser	cgc Arg	aac Asn	acg Thr	240
occ Pro	gca Ala	gag Glu	cat His	ct9 Leu 85	aac Asn	aac Asn	ttc Phe	tac Tyr	tgt Cys 90	aac Asn	ttt Phe	gaa Glu	gat Asp	att Ile 95	cag Gln	288
gat Asp	cag Gln	aac Asn	ttt Phe 100	gac Asp	ggt Gly	ttg Leu	att Ile	gta Val 105	Thr	ggt Gly	gcg	ccg Pro	ctg Leu 110	Gly	ctg Leu	336
gtg Val	gag Glu	ttt Phe 115	aat Asn	gat Asp	gtc Val	gct Ala	tac Tyr 120	tgg Trp	ccg Pro	cag Gln	atc Ile	aaa Lys 125	cag Gln	gtg Val	ctg Leu	384
gag Glu	tgg Trp 130	tcg Ser	aaa Lys	gat Asp	cac His	gtc Val 135	acç Thr	tog Ser	acg Thr	ctg Leu	ttt Phe 140	gtc Val	tgc Cys	tgg Trp	gcg Ala	432
gta Val 145	cag Gln	gcc Ala	gcg Ala	ctc Leu	aat Asn 150	atc Ile	ctc Leu	tac Tyr	ggc Gly	att Ile 155	cct Pro	aag Lys	caa Gln	act Thr	ege Arg 160	480
acc Thr	gaa Glu	aaa Lys	ctc Leu	tct Ser 165	ggc Gly	gtt Val	tac Tyr	gag Glu	cat His 170	cat His	att Ile	ctc Leu	cat His	cct Pro 175	cat His	528
gcg Ala	ctt Leu	ctg Leu	acg Thr 180	cgt Arg	ggc Gly	ttt Phe	Asp	gat Asp 185	tca Ser	ttc Phe	ctg Leu	gca Ala	ccg Pro 190	cat His	tog Ser	576
cgc Arg	TAT	gct Ala 195	gac Asp	ttt Phe	ccg Pro	Ala	gcg Ala 200	ttg Leu	att Ile	cgt Arg	gat Asp	tac Tyr 205	acc Thr	gat Asp	ctg Leu	624
GIU	att Ile : 210	ctg Leu	gca Ala	gag Glu	Thr	gaa Glu 215	gaa Glu	G1 <i>y</i> 999	gat Asp	Ala	tat Tyr 220	ctg Leu	ttt Phe	gcc Ala	agt Ser	672

aaa Lys 225	ABD	aag Lys	agc Arg	att Ile	gcc Ala 230	ttt Phe	gtg Val	acg Thr	ggc ggc	cat His 235	ccc Pro	gaa Glu	tat Tyr	gat Asp	gcg Ala 240		720
caa Gln	acg Thr	ctg Leu	gcg	cag Gln 245	gaa Glu	ttt Phe	ttc Phe	cgc Arg	gat Asp 250	gtg Val	gaa Glu	gcc Ala	gga Gly	cta Leu 255	gac Asp		768
ccg Pro	gat Asp	gta Val	ccg Pro 260	tat Tyr	aac Asn	tat Tyr	ttc Phe	ccg Pro 265	cac His	aat Asn	gat Asp	ccg Pro	caa Gln 270	aat Asn	aca Thr		816
ccg Pro	cga Arg	gcg Ala 275	agc Ser	tgg Trp	cgt Arg	agt Ser	cac His 280	ggt Gly	aat Asn	tta Leu	ctg Leu	ttt Phe 285	acc Thr	aac Asn	tgg Trp		864
ctc Leu	aac Asn 290	tat Tyr	tac Tyr	gtc Val	tac Tyr	cag Gln 295	atc Ile	acg Thr	cca Pro	tac Tyr	gat Asp 300	cta Leu	cgg Arg	cac His	atg Met	!	912
	cca Pro			gat Asp	taa											!	930

<210> 26

<211> 309

<212> PRT

<213> Escherichia coli

<40:0> 26

Met Pro Ile Arg Val Pro Asp Glu Leu Pro Ala Val Asn Phe Leu Arg 1 5 10 10 15

Glu Glu Asn Val Phe Val Met Thr Thr Ser Arg Ala Ser Gly Gln Glu
20 25 30

Ile Arg Pro Leu Lys Val Leu Ile Leu Asn Leu Met Pro Lys Lys Ile

40

45

Glu Thr Glu Asn Gln Phe Leu Arg Leu Leu Ser Asn Ser Pro Leu Gln 50 55 60

Val Asp Ile Gln Leu Leu Arg Ile Asp Ser Arg Glu Ser Arg Asn Thr 65 70 75 80

Pro Ala Glu His Leu Asn Asn Phe Tyr Cys Asn Phe Glu Asp Ile Gln 85 90 95

Asp Gln Asn Phe Asp Gly Leu Ile Val Thr Gly Ala Pro Leu Gly Leu 100 105 110

Val Glu Phe Asn Asp Val Ala Tyr Trp Pro Gln Ile Lys Gln Val Leu 115 120 125

Glu Trp Ser Lys Asp His Val Thr Ser Thr Leu Phe Val Cys Trp Ala 130 135 140

Val Gln Ala Ala Leu Asn Ile Leu Tyr Gly Ile Pro Lys Gln Thr Arg 145 150 155 160

Thr Glu Lys Leu Ser Gly Val Tyr Glu His His Ile Leu His Pro His 165 170 175

Ala Leu Leu Thr Arg Gly Phe Asp Asp Ser Phe Leu Ala Pro His Ser 180 185 190

Arg Tyr Ala Asp Phe Pro Ala Ala Leu Ile Arg Asp Tyr Thr Asp Leu 195 200 205

Glu Ile Leu Ala Glu Thr Glu Glu Gly Asp Ala Tyr Leu Phe Ala Ser 210 215 220

Lys Asp Lys Arg Ile Ala Phe Val Thr Gly His Pro Glu Tyr Asp Ala 225 230 235 240

Gln Thr Leu Ala Gln Glu Phe Phe Arg Asp Val Glu Ala Gly Leu Asp 245 250 255

Pro Asp Val Pro Tyr Asn Tyr Phe Pro His Asn Asp Pro Gln Asn Thr 260 265 270

Pro Arg Ala Ser Trp Arg Ser His Gly Asn Leu Leu Phe Thr Asn Trp 275 280 285

Leu Asn Tyr Tyr Val Tyr Gln Ile Thr Pro Tyr Asp Leu Arg His Met 290 295 300

Asn Pro Thr Leu Asp 305

<210> 27

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 27

ccagacgcac aagaagttgt c

<210> 28

<211> 27

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic DNA

<400> 28

tagategtat agegtgetet ggtagae

<210> 29

<211> 5

<212> PRT

<213> Escherichia coli

<400> 29

Ala Met Leu Pro Val 1 5



AND RELATED FEDERAL AND IT'S LITIGATION

WWW,OBLON,COM

FACSIMILE

PLEASE CALL US AT (703) 413-3000 IF THE MESSAGE YOU RECEIVE IS INCOMPLETE OR NOT LEGIPLE

May 23, 2002 TO Christian L. Fronda DATE NAME ATTORNEYS AT LAW U.S. Patent and Trademark Office COMPANY/FIRM FAX# FOURTH FLOOR 1765 JEPPERSON DAVIS HIGHWAY ARLINGTON, VIRGINIA 22202 NUMBER OF PAGES INCLUDING COVER: CONFIRM FAX: DYES DINO USA 0010-1057-0 **FROM** Thomas Barnes (703) 413-3000 OUR REFERENCE (703) 413-2220 FACSIMILE 703-412-3525 <u>Serial No. 09/441,055</u> CBLONPAT@CBLON.COM **DIRECT PHONE #** YOUR REFERENCE PATENT, TRADEMARK AND COPYRIGHT LAW

MESSAGE

In accordance with your instructions in our telephone discussion of May 22, 2002, I have attached a copy of the Sequence Listing filed on February 19, 2002.

Please call if you have any questions.

Unless otherwise Indicated or obvious from the nature of the transmittal, the Information contained in this facsimile message is attorney privileged and confidential information intended for the use of the Individual or entity named above. If the reader of this message is not the intended recipient or the employee or agent responsible to deliver it to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error or are not sure whether it is privileged, please immediately notify us by telephone and return the original message to us at the above address via the U.S. Postal Service at our Expense. Thank You.